CLAIMS

1.   A picture decoding method for decoding coded pictures by inverse quantization and inverse orthogonal transformation performed on a block-by-block basis, the method comprising, as a

5   process of inverse quantization:

multiplying a quantization matrix and a multiplier, the quantization matrix defining a scaling ratio of a quantization step for each component, and the multiplier being a coefficient for orthogonal transformation or a quantization step; and

10   multiplying a product resulted from the multiplication and a quantized value.

2.   The picture decoding method according to Claim 1,

wherein the multiplication between the quantization matrix

15   and the multiplier is executed for each coded data of a predetermined unit, and

the multiplication between the product and the quantized value is executed on a block-by-block basis, the coded data of a predetermined unit including coded blocks, and the product being

20   common to the coded blocks.

3.   The picture decoding method according to Claim 2,

wherein the product resulted from the multiplication between the quantization matrix and the multiplier is stored in a memory,

25   and

the multiplication between the product and the quantized value involves reference to the memory.

4.   The picture decoding method according to Claim 2,

30   wherein the coded data of a predetermined unit is data that corresponds to a picture.

5.   The picture decoding method according to Claim 2,
        wherein the multiplier relates to a normalization factor used in a process of inverse orthogonal transformation.

5   6.   A picture coding method for coding pictures by orthogonal transformation and quantization performed on a block-by-block basis, the method comprising, as a process of quantization:
        multiplying an inverse number of a scaling ratio in a quantization matrix and a multiplier, the quantization matrix
10   defining a scaling ratio of a quantization step for each component, and the multiplier being a coefficient for orthogonal transformation or a quantization step; and
        multiplying a product resulted from the multiplication and a value to be quantized.

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7.   The picture coding method according to Claim 6,
        wherein the multiplication between the inverse number of the scaling ratio and the multiplier is executed on a predetermined unit basis, and
20   the multiplication between the product and a value to be quantized is executed on a block-by-block basis, the predetermined unit including blocks, and the product being common to the blocks.

8.   The picture coding method according to Claim 7,
25   wherein the product resulted from the multiplication between the inverse number of the scaling ratio and the multiplier is stored in a memory, and
        the multiplication between the product and a value to be quantized involves reference to memory.

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9.   The picture coding method according to Claim 7,
        wherein the predetermined unit corresponds to a picture.

10.   The picture coding method according to Claim 7,

the multiplier relates to a normalization factor used in a process of inverse orthogonal transformation.

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11.   A picture decoding apparatus that decodes coded pictures by inverse quantization and inverse orthogonal transformation performed on a block-by-block basis, the apparatus comprising

first and second multiplication units operable to perform inverse quantization,

wherein the first multiplication unit multiplies a quantization matrix and a multiplier, the quantization matrix defining a scaling ratio of a quantization step for each component, and the multiplier being a coefficient for orthognal transformation or a quantization step, and

the second multiplication unit multiplies a product resulted from the multiplication executed by the first multiplication unit and a quantized value.

20   12.   A picture coding apparatus that codes pictures by orthogonal transformation and quantization performed on a block-by-block basis, the apparatus comprising

first and second multiplication units operable to perform quantization,

wherein the first multiplication unit multiplies an inverse number of a scaling ratio in a quantization matrix, and a multiplier, the quantization matrix indicating a scaling ratio of a quantization step for each component, and the multiplier being a coefficient for orthognal transformation or a quantization step, and

the second multiplication unit multiplies a product resulted from the multiplication executed by the first multiplication unit and a value to be quantized.

13.   A program for decoding coded pictures by inverse quantization and inverse orthogonal transformation performed on a block-by-block basis, the program causing a computer to execute,

5   as a process of inverse quantization:

multiplying a quantization matrix and a multiplier, the quantization matrix defining a scaling ratio of a quantization step for each component, and the multiplier being a coefficient for orthogonal transformation or a quantization step; and

10   multiplying a product resulted from the multiplication and a quantized value.

14.   A program for coding pictures by orthogonal transformation and quantization performed on a block-by-block basis, the program

15   causing a computer to execute, as a process of quantization:

multiplying an inverse number of a scaling ratio in a quantization matrix and a multiplier, the quantization matrix defining a scaling ratio of a quantization step for each component, and the multiplier being a coefficient for orthogonal transformation

20   or a quantization step; and

multiplying a product resulted from the multiplication and a value to be quantized.

15.   A semiconductor apparatus that decodes coded pictures by

25   inverse quantization and inverse orthogonal transformation performed on a block-by-block basis, the apparatus comprising

first and second multiplication units operable to perform inverse quantization,

wherein the first multiplication unit multiplies a quantization

30   matrix and a multiplier, the quantization matrix defining a scaling ratio of a quantization step for each component, and the multiplier being a coefficient for orthogonal transformation or a quantization

step, and

the second multiplication unit multiplies a product resulted from the multiplication and a quantized value.

5   16.   A semiconductor apparatus that codes pictures by orthogonal transformation and quantization performed on a block-by-block basis, the apparatus comprising

first and second multiplication units operable to perform quantization,

10   wherein the first multiplication unit multiplies an inverse number of a scaling ratio in quantization matrix and a multiplier, the quantization matrix defining a scaling ratio of a quantization step for each component, and the multiplier being a coefficient for orthogonal transformation or a quantization step, and

15   the second multiplication unit multiplies a product resulted from the multiplication executed by the first multiplication unit and a value to be quantized.